The External-Economics-Model Plug-In For Ecopath With Ecosim

Directions for running the linked models:

You should have received a zip file. Unzip this zip file somewhere on your computer, and look at the unzipped files with Windows Explorer. Inside a folder called **ewe\_program** you should find a file named **EwE6.exe**. You can double-click this file (or make a shortcut to it elsewhere, e.g. on your desktop) in order to run Ecopath with Ecosim.

When the EwE window comes up, go to **File | Open Model**. (If you've already opened your model once on this computer, you should be able to go to **File | Open Recent Model** instead.)

Now, choose your EwE model file, whose name should end with ".ewemdb" The current draft model that we have sent you is named "**final\_basemodel\_withAC\_May16\_LD\_1.ewemdb**". It is also inside the zip file that we sent, but in a subfolder called **ewe\_model**.

When this model loads, you should see a grid of numbers appear on the right part of the window, and you'll have a pane on the left labeled "Navigator" with several icons in it. Notice that the "Navigator" pane contains a visual "tree" of expandable/collapsible components. You can either click on the text label of a component, or on the [+] symbol next to a component, to expand that component and see what's inside it. Several of the following directions will refer to things found under the "Navigator" pane.

Now, go to **Navigator | Time Dynamic (EcoSim) | Input | Time Series**.

When you do this (for the first time after opening a model), several things will happen. First, EcoPath (but not yet EcoSim) will run, and you will probably get a dialog box warning you that "**Your model has 2 group(s) that have a diet with imports only...**" You can ignore this dialog box and press "**OK**".

Next, a dialog box will pop up with the title "Load Ecosim scenario". On this box, **double-click** on the text that says "**asian carp uncertainty**", which is the name of the Ecosim scenario we're using. The dialog box should close after your double-click.

Next , a dialog box will pop up with the title "Manage Time Series". On this box, **double-click** on the text that says "**stocking\_120years**". The dialog box should close after your double-click.

Now, you should check the model-linking configuration. To do this, go to the menu at the very top of the window (*not in the navigator pane, and not the word Ecosim with an orange clock icon next to it, which is right underneath the menu bar*) and choose **Ecosim | Configure External Economics Model**. Note that if you have already configured the external economics model plug-in for this particular EwE model, and you've saved your settings using the button on that configuration window, then you don't have to open this configuration window every time; the settings will stay the same. Then again, it doesn't hurt to check that they are correct.

On the external economics model plug-in configuration window, you will need to set several settings:

First of all, you should click the checkbox at the top, labeled "**Master Control**." Checking this box tells the EwE plug-in that it should try to talk to the economics model while running Ecosim. Unchecking the box will make it so that Ecosim runs without any connection to the economics model.

Next, fill in the full path to **GAMS.exe** on your computer. (e.g. with the **Browse** button)

Next, fill in the full path to the **GAMS model file (whose name probably ends in ".gms")**.

Next, in the bottom box, you can enter the list of species names to send from EwE to GAMS. You probably want the following setting (you can just copy and paste it right from this document):

**WY-1,WY-2,YP-2,LW,WB,WP,BB,RS,SB,RT,LT,SUCKER,CATFISH,PANFISH**

*(Note that the above text has YP-2 (which I think this is correct) not YP-1 (which I think is incorrect) for yellow perch. Make sure your GAMS model is expecting to see YP-2, not YP-1. Then you can use the text above.)*

Finally, click "**Save settings to current Ecosim scenario**" at the bottom. Then you can close the dialog box.

Finally, you're ready to run EcoSim. Click through the navigator like this:

**Navigator | Time Dynamc (Ecosim) | Output | Run Ecosim**

After a few moments, a new pane will come up on the right side of the screen, with a button on the right side that says "**Run Ecosim**". Click that button to run Ecosim now. It should take 1-2 minutes.

Note that if you want to modify the GAMS model and try running Ecosim again, you can repeat just the last step (clicking the "**Run Ecosim**" button) as many times as you want. If you have modified your GAMS model, the system will use the most recent version of your GAMS model—that is, you don't have to repeat all the earlier steps of this document in order to get EwE to use your latest GAMS model.

If you see any error messages *please report them to the link plug-in programmer,* Jason Breck, by e-mail at: < [jbreck@umich.edu](mailto:jbreck@umich.edu) >.

You can view ecological results with the Ecopath with Ecosim software. But, to view the economic results, you probably want to look at the output spreadsheets that were automatically produced. To view the output spreadsheets, first open the folder that contains your EwE model file (the one whose name ends in ".ewemdb") in Windows Explorer. On the next page, you'll see an example of what you will find there:

Here is an example of the layout of output files produced by the model-linking plug-in. This is relative to the folder containing your EwE model file:

|  |  |
| --- | --- |
| final\_basemodel\_withAC\_May16\_LD\_1.ewemdb | <your EwE model> |
| [model\_linking\_files] | <a subfolder of the folder your EwE model is in> |
| [run1\_2013\_06\_10\_at\_09\_19\_21] | <a subfolder of model\_linking\_files> |
| [run2\_2013\_06\_11\_at\_09\_46\_41] | <another subfolder of model\_linking\_files> |
| [run3\_2013\_06\_11\_at\_09\_51\_51] | <another subfolder of model\_linking\_files> |
| **link\_biomass\_catch\_relative\_output...csv** | **<biomass&catch output sheet for run3>** |
| **link\_econ\_output...csv** | **<econ output sheet for run3>** |
| [year2] | <a subfolder of run3, for year 2 of model time> |
| catch\_out.txt | <GAMS catch output for run 3 year 2> |
| econ\_out.txt | <GAMS economics output for run 3 year 2> |
| LakeErieLinked530.log | <GAMS log file for run 3 year 2> |
| LakeErieLinked530.lst | <GAMS list file for run 3 year 2> |
| stock\_in.txt | <GAMS stock input file for run 3 year 2> |
| [year3] | <a folder for year 3 of model time> |
| ... | <more folders for years up to 120> |

As you can see, each time you run Ecosim while linked to the economics model, a subfolder of **model\_linking\_files** is created and given a name like **runX\_DATE\_at\_TIME**. In bold, in the table, are the two main output spreadsheets that you will probably want to see. Within the run folder, there will also be year folders showing what happened on each individual year of interaction between the models. Those files are especially useful to look at if GAMS has reported any kind of error.